WHAT IS CLAIMED IS:

1. A method of fabricating a micro-lens, comprising the steps of:

(a) forming a thin film of a material for the micro-lens on a substrate;

(b) forming a photoresist pattern on the thin film;

(c) forming a thin-film structure by etching the thin film using the photoresist pattern; and

(d) forming the micro-lens by reflow by thermally treating the thin-film structure.

2. The method of claim 1, wherein the thin film material in step (a) comprises SiO_2 containing a dopant.

3. The method of claim 2, wherein the dopant comprises one of GeO_2, P_2O_5, B_2O_3, TiO_2, and Al_2O_3.

4. The method of claim 2, wherein the dopant includes one or more materials selected from the group consisting of GeO_2, P_2O_5, B_2O_3, TiO_2, and Al_2O_3.

5. The method of claim 1, wherein a plurality of micro-lenses are fabricated on the substrate, and the shape of each micro-lens is controlled according to a distance between respective thin-film structures arranged on the substrate to form the plurality of micro-lenses.

6. The method of claim 1, wherein the shape of the micro-lens is controlled according to the thickness of the thin film formed in step (a) and the shape of the photoresist pattern formed in step (b).

7. The method of claim 1, further comprising: (e) forming a non-reflective coating layer on the surface of the micro-lens.

8. A micro-lens manufactured according to the process recited in claim 1.

9. A micro-lens manufactured according to the process recited in claim 3.

10. An array of micro-lenses manufactured according to the process recited in claim 5.

11. A method of fabricating an optical module having a micro-lens integrated therein, comprising the steps of:

(a) sequentially forming a lower cladding layer and a core layer on a substrate;

(b) forming a planar lightwave circuit (PLC) pattern on the substrate by selectively etching the core layer and the lower cladding layer;

(c) forming a PLC by forming an upper cladding layer on the overall surface of the substrate;

(d) forming a thin-film structure in a lens forming area by selectively removing the upper cladding layer in an area other than the area of the PLC and the lens forming area; and

(e) forming the micro-lens by reflow by thermally treating the thin-film structure.

12. The method of claim 11, wherein the thin film is formed of SiO_2 containing a dopant.

13. The method of claim 12, wherein the dopant comprises one of GeO_2, P_2O_5, B_2O_3, TiO_2, and Al_2O_3.

14. The method of claim 12, wherein the dopant includes one or more materials selected from the group consisting of GeO_2, P_2O_5, B_2O_3, TiO_2, and Al_2O_3.

15. The method of claim 11, wherein the shape of the micro-lens is controlled according to the shape of the photoresist pattern and the thickness of the upper cladding layer.

16. The method of claim 11, further comprising: (f) forming a non-reflective coating layer on the surface of the micro-lens.

17. An optical module manufactured according to the process recited in claim 11.

18. An optical module manufactured according to the process recited in claim 13.

19. A micro-lens comprising:

a thin film of a material arranged on a substrate;

a photoresist pattern formed on the thin film, wherein a thin-film structure is formed by etching the thin film using the photoresist pattern; and

a lens comprising the thin-film structure reflowed on the substrate.

20. An optical module having a micro-lens integrated therein, comprising:

a lower cladding layer and a core layer arranged on a substrate;

a planar lightwave circuit (PLC) pattern arranged on the substrate by selectively etching portions of the core layer and the lower cladding layer from the substrate;

an upper cladding layer arranged on the overall surface of the substrate; and

a thin-film structure arranged in a lens forming area of the substrate by removing the upper cladding layer in an area other than the area of the PLC and the lens forming area; and

a lens comprising a controlled reflow of the thin-film structure.